

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference  03-004-B	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No.  PCT/US 03/36747	International filing date (day/month/year)  13/11/2003	(Earliest) Priority Date (day/month/year)  12/11/2002
Applicant  RIGEL PHARMACEUTICALS, INC.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 8 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

**RHDANINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM**

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

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## Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

This invention describes rhodanine derivatives and pharmaceutical compositions useful as inhibitors of ubiquitination. The compounds and compositions of the invention are useful as inhibitors of the biochemical pathways of organisms in which ubiquitination is involved. In particular, the compounds and compositions are useful for treating cell proliferative diseases such as cancers.

## INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07D417/06 C07D417/14 A61K31/427 A61P35/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, CHEM ABS Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02 051409 A (KYOWA HAKKO KOGYO KK; AKAMA TSUTOMU (US); GERON CORP (US); HOLCOMB) 4 July 2002 (2002-07-04) examples 1-5, 7, 10-13, 17, 18, 28, 30, 32, 34-36, 39, 40, 43-47, 54-56 claims 1,22-30 ---	1-5, 11, 15-17
X	WO 02 053155 A (YAMASHITA YOSHINORI; HAGIHARA KOJI (JP); ARAI HITOSHI (JP); ASAI A) 11 July 2002 (2002-07-11) page 26 -page 75; claims ---	1-11, 15-17
X	WO 98 53790 A (BIEDIGER RONALD J; SCOTT IAN L (US); MARKET ROBERT V (US); TEXAS B) 3 December 1998 (1998-12-03) page 10, line 16 - line 20; claims --- -/--	1-11, 15-17

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the international search

22 March 2004

Date of mailing of the international search report

29/03/2004

Name and mailing address of the ISA

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Internat'l Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 10573 A (BAILEY THOMAS R; VIROPHARMA INC (US); YOUNG DOROTHY C (US)) 2 March 2000 (2000-03-02) claims 1,17,19,21,22,29,30,36,37,47; tables I,II,IV,V,VI ---	1-11
X	WO 00 32598 A (STRUCTURAL BIOINFORMATICS INC) 8 June 2000 (2000-06-08) figure pages 1/25 to 23/25 ---	1-11
X	WO 01 77091 A (JAEN JUAN C; LI YANG (US); PIPER DEREK E (US); TULARIK INC (US); P) 18 October 2001 (2001-10-18) figure pages 1/20 to 19/20 claims 23-25 ---	1-4,11
X	EP 0 587 377 A (LILLY CO ELI) 16 March 1994 (1994-03-16) examples 2, 3, 6, 9, 10, 13-16, 22, 23, 33-36, 39, 75, 76 ---	1-4,11
X	EP 1 207 155 A (SHIONOGI & CO) 22 May 2002 (2002-05-22) page 39, compound no. 3 ---	1,2,11
X	US 2 824 087 A (UNRUH CORNELIUS C ET AL) 18 February 1958 (1958-02-18) table I, examples 4-6, 9, 11 ---	1,2,11
X	EP 0 976 748 A (SHIONOGI & CO) 2 February 2000 (2000-02-02) page 40, reaction 8 -> 9 and page 42, lines 35, 36, compound 4-(2,4-dioxothiazolidine-5-ylidenemethyl)- benzoic acid ---	1,2,11
X	US 5 554 767 A (YUEN PO-WAI ET AL) 10 September 1996 (1996-09-10) examples 1, 2, 7, 9, 11, 15, 19, 21, 24, 26, 28, 30, 35, 37, 39, 41, 48, 50, 52 ---	1,2,11
X	EP 0 343 643 A (WARNER LAMBERT CO) 29 November 1989 (1989-11-29) examples 7, 8, 17, 26-32, 34, 38-41, 43, 54, 57, 61, 65, 104, 105 ---	1,2,11
X	WO 00 18748 A (SCHAEFER WOLFGANG; HOFFMANN EIKE (DE); HONOLD KONRAD (DE); KALUZA) 6 April 2000 (2000-04-06) pages 10 to 16, compounds 1-4, 21, 22, 33, 41, 44, 46, 49, 54-57, 59, 60, 65, 74, 82, 84, 97, 100, 103, 106, 110, 114, 116, 134-136, 170, 181, 186, 195, 196, 198-200, 202, 209, 210, 215, 216 ---	1,2,11
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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 18746 A (SCHAEFER WOLFGANG; HONOLD KONRAD (DE); KALUZA KLAUS (DE); ESSWEIN) 6 April 2000 (2000-04-06) pages 9 to 16, compounds 1-3, 5, 6, 27, 28, 42, 56, 58, 62, 70-72, 74-77, 81, 99, 101, 107, 114, 117, 119, 120, 125, 129, 130, 132, 137, 151, 157-159, 188, 198, 214, 220, 229, 231, 237, 238 ---	1,2,11
X	US 4 358 521 A (KONDO SYUNICHI ET AL) 9 November 1982 (1982-11-09) column 11, example 11 ---	1,2
X	US 3 678 041 A (MOUSSERON MAX J) 18 July 1972 (1972-07-18) tables I,II,III ---	1,2
X	WO 01 10881 A (3M INNOVATIVE PROPERTIES CO) 15 February 2001 (2001-02-15) page 52, Sequence 3 page 52, line 5 - line 10 ---	1-4
P,X	GB 2 387 172 A (PANTHERIX LTD) 8 October 2003 (2003-10-08) table 1 ---	1-11
P,X	GB 2 386 892 A (PANTHERIX LTD) 1 October 2003 (2003-10-01) page 7 ---	1-11
P,X	WO 03 072033 A (PELLECCHIA MAURIZIO; CHANG EDCON (US); DONG QING (US); HANSEN MARK) 4 September 2003 (2003-09-04) claims 1,2,5-11,20,21,23,25-27,34,45,46,49,51,52 ---	1-10
P,X	WO 03 027081 A (KAARSHOLM NIELS C; JAKOBSEN PALLE (DK); LUDVIGSEN SVEND (DK); MADS) 3 April 2003 (2003-04-03) examples 60, 61, 63, 64, 68, 70, 74, 76, 78, 81, 83, 87, 91-96, 98, 110, 114-117, 124, 125, 130-132, 135, 136, 141, 144, 148, 151, 154, 155, 159-162, 164-166, 170, 173, 186, 192, 206, 207, 213, 216, 224, 227, 229, 233, 234, 236, 260, 262, 263, 269, 274 ---	1,2,11
A,P	WO 03 043998 A (MAXIA PHARMACEUTICALS INC) 30 May 2003 (2003-05-30) claims 1,42-48; examples -----	1-11, 15-17

# INTERNATIONAL SEARCH REPORT

International application No.  
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## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
  
Although claims 12-17 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/36747

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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